Top Secret

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

BASIC
IMAGERY
INTERPRETATION
REPORT

SRI HARIKOTA COMPLEX (S)

BE: Various

MISSILE RANGES: STRATEGIC SSM SPACE FACILITIES
INDIA
JUNE 1979

Top Secret

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INSTALLATION OR ACTIVITY NAME					COUNTRY
Sri Harikota Complex					IN
UTM COORDINATES	GEOGRAPHIC COORDINATES	CATEGORY	BE NO.	COMIREX NO.	NIETB NO.
NA	See below	See below	See below	See below	See below

MAP REFERENCE

AMS. Series U502, Sheet ND 44-10, scale 1:250,000

LATEST IMAGERY USED	NEGATION DATE (If required)
	NA

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Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN) No
Sri Harikota Propellant Plant SPROB	13-47-10N 080-12-20E				
Sri Harikota Island Rocket Motor Test Facility	13-44-56N 080-14-12E				
Sri Harikota Island Rocket Launch Station	13-41-00N 080-13-40E				
Sri Harikota Island Tracking Facility	13-41-08N 080-12-53E				
Sri Harikota Ground Telemetry Satellite Tracking Station	13-40-45N 080-11-30E				
Sri Harikota Space Launch Facility	13-40-25N 080-13-35E				

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ABSTRACT

1. (TSR) The Sri Harikota Complex in India is currently engaged in the production, testing, launching, and tracking of various types of sounding rockets, the SA-2/-75 SAM system (an indigenous version of the Soviet SA-2), and a satellite launch vehicle, the SLV-3. The complex consists of a propellant plant, a rocket motor test facility, a rocket launch station, a tracking facility, a ground telemetry satellite tracking station, and a space launch facility. This report describes activity observed at the Sri Harikota Complex from [redacted] 25X1 25X1

2. (C) Sixteen annotated photographs, a line drawing of a liquid engine test stand, and chronological and mensural data are included in this report, which is the first basic report on this complex. NPIC reports [redacted] are also updated. 25X1

INTRODUCTION

3. (U) The Sri Harikota Complex or SHAR[1] is on the east coast of India, about 40 nautical miles (nm) north of Madras. The complex is on an island with the Bay of Bengal to the east, Pulicat Lake to the south and southwest, and a great salt water marsh to the north and northwest. The island is relatively flat; the highest elevation point is less than 9.9 meters (30 feet). The complex consists of a propellant plant, a rocket motor test facility, a rocket launch station, a tracking facility, a ground telemetry satellite tracking station, and a space launch facility (Figure 1).

4. (TSR) All areas of SHAR are in use with only minor construction projects presently underway on the island. The complex is served by probable asphalt roads and by a small helipad. The nearest rail line to the complex is 10.5 nm to the west, at Suluru. The nearest major airfield and port facilities are 40 nm to the south, at Madras.

5. (TSR) SHAR was not present when the island was seen on photography of [redacted] 25X1 The early chronology of construction activity cannot be established because the complex area was not imaged again until 1973. However, the installation was reported to be under construction in May 1970[2] and to be operational in 1971.[3] The first liquid propellant rocket was reportedly launched from Sri Harikota in 1973,[4] and the first altitude-controlled and guided two-stage rocket was launched from SHAR on [redacted] Reference 6 was used to aid in the identification of some structures.[6] 25X1 25X1 25X1

BASIC DESCRIPTION

Sri Harikota Propellant Plant SPROB

6. (S/WNINTEL) The Propellant Plant SPROB consists of a production area, a test area, and a storage area.

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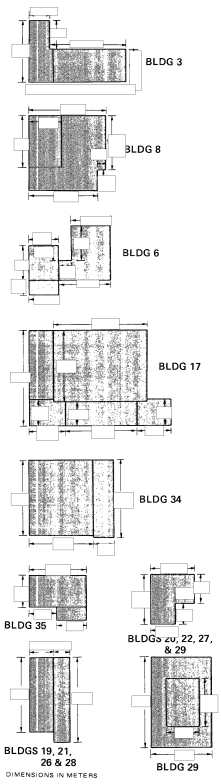

7. (U) The current production capacity of the plant is reported to be 250 tons of solid propellant a year,[1] while the total weight of a single SLV-3 system is approximately 17 tons. This suggests that if the launch program is successful, the Indians could produce sufficient fuel for approximately 12 to 13 launch vehicles per year.

Production Area

8. (TSR) Buildings for a production line have been constructed in the production area (Figure 2 and Table 1) on the periphery of a road in an oval pattern. The first building on the east side of the entrance road is for case preparation. Proceeding counterclockwise, the major buildings are a probable oxidizer preparation building, a revetted grinding and blending building, a probable drying building, a support building, two sets of revetted propellant mixing and control buildings, a probable premix preparation building, two additional sets of revetted propellant mixing and control buildings, a casting building, a control building, two curing buildings, a storage building, a revetted storage building, three storage buildings, and a weighing/inspection building at an access road immediately west of the entrance road.

9. (TSR) An equipment maintenance building and an administration/laboratory building situated on the outer side of a circular road and a support building on the inner side of the circular road in the center of the oval road pattern are within the production line.

10. (TSR) A control building and a possible cutting and trimming building are along the road to the test area.

Table 1. Structures in Production Area of the Sri Harikota Propellant Plant SPROB
(Items keyed to Figure 2)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete	Remarks
1	Substation					Apr 74	Not present in Jan 74
2	Admin bldg				May 74	Feb 75	
3	Vehicle storage shed					Jun 75	Five bays, not present in Jan 75
4	Weighing/inspection bldg				Mar 78	Nov 78	
5	Support bldg					Feb 77	Not present in Mar 76
6	Prob drying bldg				Jan 75	Jul 75	
7	Grinding & blending bldg				May 74	Jan 75	
8	Prob oxidizer prep bldg				Apr 74	Oct 74	
9	Case prep bldg				Oct 74	Feb 76	
10	Support bldg				Oct 74	Jan 75	
11	Storage bldg				Apr 74	Oct 74	
12	Storage bldg				Apr 74	Oct 74	
13	Storage bldg				Apr 74	Oct 74	
14	Revetted storage bldg					Jun 75	Not present in Jan 75
15	Admin/lab bldg				Apr 74	Jun 75	
16	Support bldg				Oct 74	Jan 75	
17	Equipment maint bldg				Apr 74	Feb 75	
18	Storage bldg				Apr 73	Jan 74	
19	Mixing bldg				Jun 74	Feb 75	
20	Control bldg				Apr 74	Oct 74	
21	Mixing bldg				May 74	Feb 75	
22	Control bldg				Apr 74	Oct 74	
23	Prob premix prep bldg				Jan 75	Jul 75	
24	Support bldg				Jan 75	Jul 75	
25	Support bldg				Oct 74	Jan 75	
26	Mixing bldg				Apr 74	Jan 75	
27	Control bldg				Apr 74	Oct 74	
28	Mixing bldg				Apr 74	Jan 75	
29	Control bldg				Apr 74	Oct 74	
30	Casting bldg				Oct 74	Feb 76	
31	Support bldg				Oct 74	Feb 75	
32	Vehicle storage shed					Mar 77	Two bays, not present in Oct 76
33	Control bldg				Oct 74	Jun 75	
34	Curing bldg				Oct 74	Feb 76	
35	Curing bldg				Feb 78	Nov 78	
36	Control bldg					Jun 75	Connected by conduit system to item 37, not present in Feb 75
37	Poss cutting & trimming bldg				Jan 75	Feb 76	

Test Area

11. (TSR) The test area (Figure 3 and Table 2) is northeast of the oval road of the production area. The test area contains a possible nondestructive test building, a waste product burn area, and a small two-bay propellant test cell.

Storage Area

12. (TSR) The storage area (Figure 1) is approximately 1.6 nm northeast of the production area and consists of a single revetted magazine storage building.

Sri Harikota Island Rocket Motor Test Facility

13. (TSR) The Rocket Motor Test Facility consists of a rocket motor test area and a nondestructive test area. This portion of the report updates a previous NPIC report.[7]

Rocket Motor Test Area

14. (TSR) The rocket motor test area (Figure 4 and Table 3) comprises the eastern half of the facility. Each of the two revetted horizontal test positions consists of two test cells in an E-shaped revetment with a concrete blast apron and an earthen blast deflector along the open side. A test control building is between these two test positions. East of the horizontal positions is a drop and destruction test position with its own control building. A probable vibration test building is west of the northern test position. A small liquid engine test stand (Figure 5) is immediately southwest of the southern test position. An acceleration test position with a control building is at the southern end of this area.

15. (TSR) An increase in liquid engine launch-related activity can be expected with the successful launch of an SLV-3. The liquid engine test stand in the Rocket Motor Test Facility is in the only area at Sri Harikota Island that has been positively identified as liquid related. The follow-on system to the SLV-3 will reportedly have a combination of liquid and solid stages.[4,8]

16. (TSR) The central test control building is connected by a cable conduit system to all of the test buildings/positions with the exception of the acceleration test position. All four stages of the SLV-3 were reportedly tested at this facility.[9]

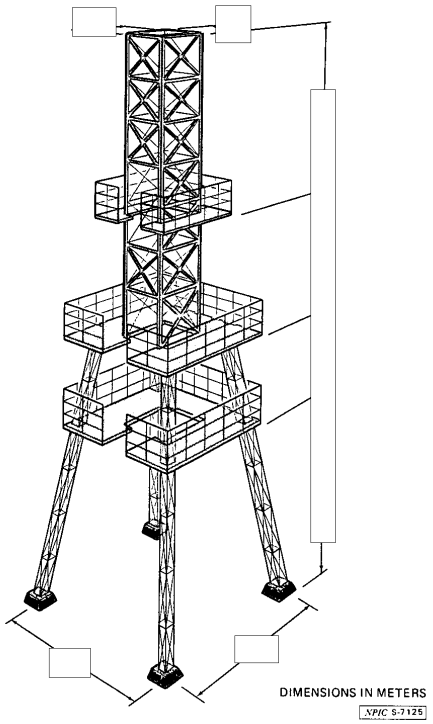

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FIGURE 5. LINE DRAWING OF LIQUID ENGINE TEST STAND IN THE ROCKET MOTOR TEST AREA

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Nondestructive Test Area

17. (TSR) The western half of the nondestructive test area (Figure 6 and Table 4) contains several major buildings. Included are a probable high-altitude test building for solid motors which is connected by a cable conduit system to the central test control building, a probable rocket assembly building, a final assembly building, a rocket motor storage building, and two possible environmental test buildings.

Sri Harikota Island Rocket Launch Station

18. (TSR) The Rocket Launch Station consists of a rocket/missile launch area, a rocket assembly and checkout area, a military-related support area, an administration area, two communications facilities—one microwave and one high frequency (HF), four optical tracking stations, and a main housing and storage area. This portion of the report updates a previous NPIC report.[10]

Rocket/Missile Launch Area

19. (TSR) The rocket/missile launch area (Figure 7 and Table 5) consists of four concrete pads, designated pads 1 through 4. Pad 1 is 25 meters square and contains a [redacted] launch rail, the rear of which is positioned on a semicircular track, making it possible to vary the launch azimuth. Pad 2 is 50 meters south of pad 1. This pad is a 30-meter square with a 10-meter-square appendage on the eastern side. A [redacted] launch rail was at this pad in July 1977 but has now been emplaced at the Space Launch Facility. Pad 3 is 60 meters north of pad 1 and is in the configuration of a [redacted] rectangle. A counterbalance-type launcher is on the pad which is served by an asphalt area to the east and west. Pad 4 is a 9-meter square and is 35 meters east of pad 3. This pad contains an SA-2/-75 (an indigenous version of the Soviet SA-2)-type launcher which is served by a loop road. Six camera positions (Figure 8) are in the immediate area. Pad 4 has been used for SA-2/-75 SAM launches, with a portable launcher emplaced only during a scheduled launch timeframe and then removed and stored in the military-related missile support area. The FAN SONG F radar, the only guidance radar observed to date, is also stored in the support area when it is not in use. 25X1 25X1 25X1

20. (TSR) All four launch pads are connected by a conduit system to the two launch control buildings (Figure 8 and Table 6) west of the launch area. The area also contains two meteorological towers, which are south of the control buildings, and two additional camera positions. Two portable environmental shelters are usually observed in the launch area.

Rocket Assembly and Checkout Area

21. (TSR) The rocket assembly and checkout area (Figure 8 and Table 6) is approximately 600 meters west of the launch pad area and contains two rocket assembly/checkout buildings, four administration/support buildings, and two vehicle sheds.

Military-Related Missile Support Area

22. (TSR) The military-related missile support area (Figure 8 and Table 6) is 1,050 meters northwest of the launch pad area and consists of a fence-secured facility which contains three administration-type buildings, a drive-through missile assembly/checkout building, and four equipment storage sheds.

Administration Area

23. (TSR) The administration area (Figure 1) is 3.2 nm north-northwest of the launch pad area and consists of a multiwing administration building and six support buildings.

Microwave Communications Facility

24. (TSR) The microwave communications facility (Figure 1) is 3 nm northwest of the launch pad area and contains a control building and a lattice tower. Microwave antennas may be mounted on the lattice tower.

HF Communications Facility

25. (TSR) The HF communications facility (Figure 1) is 3.1 nm southwest of the launch pad area and contains a control building, seven support buildings, and at least 12 masts.

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Table 4. Structures in the Nondestructive Test Area, Sri Harikota Island Rocket Motor Test Facility
(Items keyed to Figure 6)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete	Remarks
1	Prob high-altitude test bldg				Mar 78	Oct 78	For solid propellant motors
a	High-bay sect						
b	Low annex sect						
c	Raised rails						
2	Final assem bldg				Oct 73	Jan 75	Dimensions given for high-bay sects
3	Basin				Aug 78		
4	Test control bldg				Oct 73	Mar 74	
5	Prob rocket assem bldg				Oct 73	Sep 74	
6	Rocket motor storage bldg				Oct 73	Jan 74	
7	Support bldg				Oct 73	Sep 74	
8	Substation				Mar 74	May 74	
9	Poss environmental test bldg				Oct 73	Sep 74	
10	Poss environmental test bldg				Oct 73	Sep 74	
11	Storage bldg				Mar 77	Aug 77	
12	Storage bldg				Mar 77	Aug 77	
13	Storage bldg				Apr 77	Aug 77	
14	Horizontal storage tanks (2)				Aug 78		

Table 5. Structures in the Rocket/Missile Launch Area of Sri Harikota Island Rocket Launch Station
(Items keyed to Figure 7)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete	Remarks
1	Launch pad 2			–	Feb 75	Jan 76	Currently not in use
2	Launch pad 1			–	Present in Apr 73		Used for sounding rocket launches
3	Rail-type launcher			–			
4	Launch pad 3			–	Jan 76	Mar 76	Used for sounding rocket launches
5	Counterbalance-type launcher			–			
6	Launch pad 4			–	Mar 76	Apr 76	Used for SAM launches
7	SA-2-75 launcher			–			

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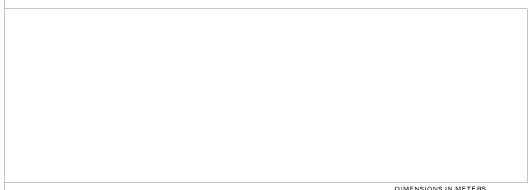

DIMENSIONS IN METERS

Table 6. Structures in the Sri Harikota Island Rocket Launch Station
(Items keyed to Figure 6)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete	Remarks
1	Interferometer					May 75	Not present in Feb 75
2	Vehicle shed				May 74	Oct 74	Three bays
3	Admin bldg				May 74	Sep 74	
4	Telemetry control bldg				May 74	Jun 75	Roof-mounted, four-element helix array antenna
5	Interferometer				Feb 76	Apr 76	
6	Admin bldg				May 74	Jun 75	
7	Vehicle shed					Oct 76	Two bays; not present in May 76
8	Vehicle/equip storage shed				Feb 75	Dec 77	Roof collapsed in 1975; entire shed reconstructed
9	Vehicle/equip storage shed				Feb 75	Jul 75	SA-2/-75 missile transporter often observed in this area
10	Vehicle shed					Oct 76	Two bays; not present in May 76
11	Missile assem/checkout bldg				May 76	Apr 77	
a	High-bay sect						
b	Annex						
12	Admin bldg				Feb 76	Oct 76	
a	Light-toned sect						
b	Dark-toned sect						
13	Admin bldg				Mar 76	Jan 77	
14	Admin bldg				Mar 76	Oct 76	
15	Vehicle shed				Jan 76	Jan 77	Four bays
16	Rocket assem/checkout bldg				Nov 75	Oct 76	
17	Substation				—	Apr 73	
18	Rocket assem/checkout bldg				—	Apr 73	
19	Poss rocket subassem bldg				—	Apr 73	
20	Meteorological tower				May 74	Sep 77	
21	Launch control bldg south				Jan 75	Oct 75	
22	Launch control bldg north				—	Apr 73	
23	Meteorological tower				Jan 75	Jan 75	

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Optical Tracking Stations

26. (TSR) Four optical tracking stations serve the launch station. Two are to the north, one is to the south, and one is to the west of the launch pads (Figure 1). These optical tracking stations form a T-shaped pattern with the launch pads at the intersection of the legs.

Main Housing and Storage Area

27. (TSR) The main housing and storage area (Figure 1) is 4.2 nm west-northwest of the launch pad area and contains eight administration-type buildings, approximately 450 quarters buildings, 30 storage buildings, a vehicle shed, and numerous support buildings.

Sri Harikota Island Tracking Facility

28. (TSR) The Tracking Facility is divided into three areas—the control/telemetry area, the COTAL tracking station, and the western tracking station.

Control/Telemetry Area

29. (TSR) The control/telemetry area consists of a control building with a roof-mounted, four-element Yagi antenna, a single-element Yagi antenna, two cross-baseline interferometers, and a support building (Figure 9).

COTAL Tracking Station

30. (TSR) The COTAL tracking station (Figure 10 and Table 7) is west of the control/telemetry area and consists of a van trailer-mounted COTAL radar, two electronics support van trailers, a support building, and two towers.

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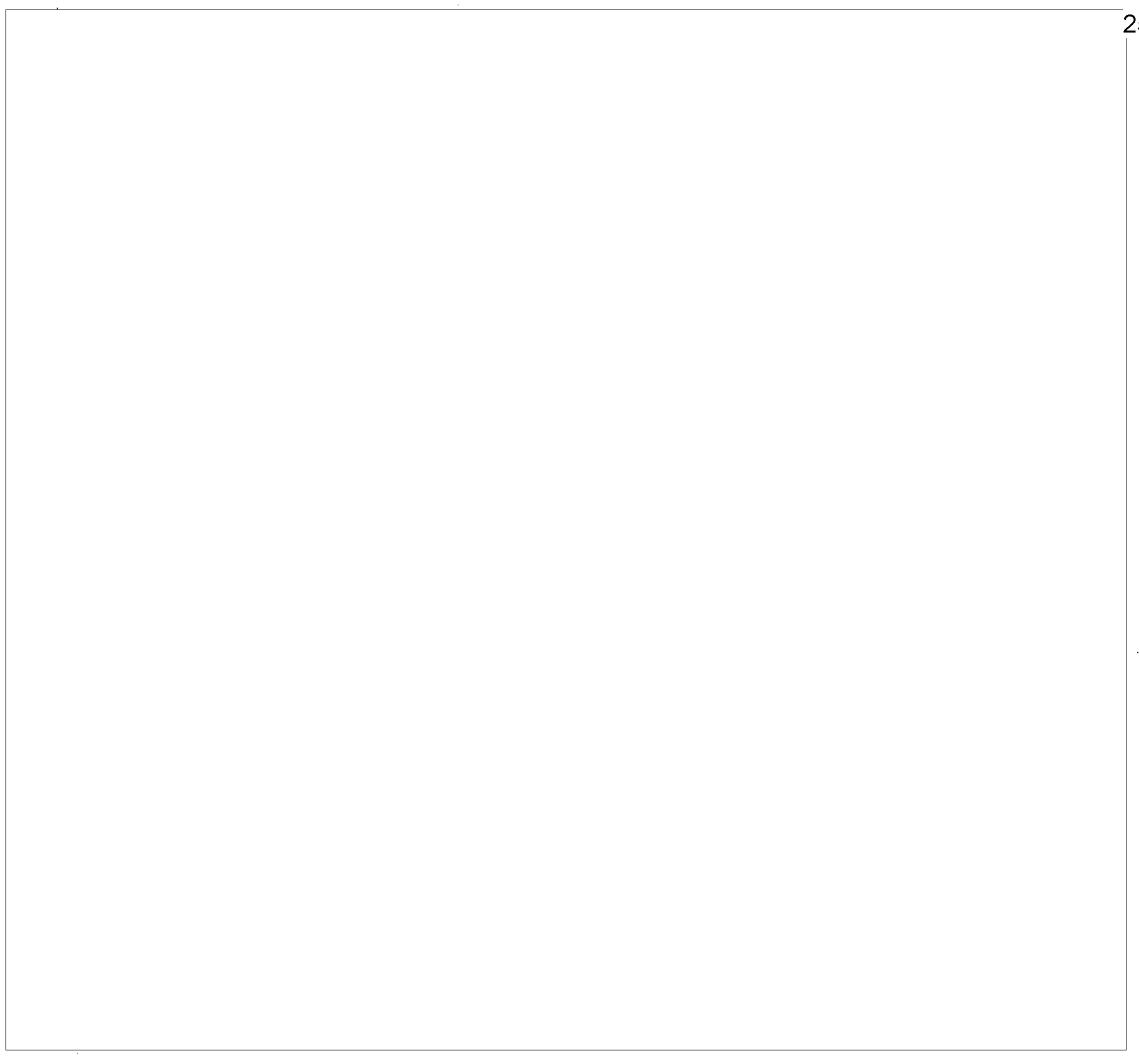

Table 7. Structures in the COTAL Tracking Station, Sri Harikota Island Tracking Facility (Items keyed to Figure 10)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	First Seen		Remarks
		Ucon	Complete	
1	Meteorological tower		Feb 76	Not present Jan 76
2	Support bldg	Jun 75	Jul 75	
3	COTAL radar van trailer	—	Jan 75	
4	Electronics support trailer		Jan 75	Until Feb 75 trailer located east of the COTAL radar van trailer
5	Electronics support trailer	—	Jul 75	
6	Observation tower		Feb 76	Not present in Jan 76

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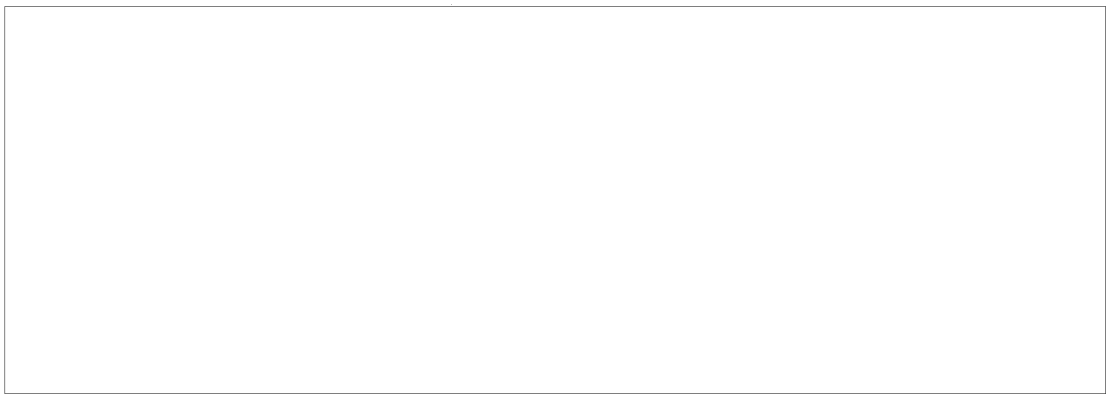

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Table 8. Structures in the Western Tracking Station, Sri Harikota Island Tracking Facility
(Items keyed to Figure 11)
This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete
1	Radar control bldg				Jun 74	May 75
a	Stairwell					
2	Parabolic antenna					Jan 77

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Western Tracking Station

31. (TSR) The western tracking station (Figure 11 and Table 8) is 1.3 nm west-northwest of the launch pad area and consists of a single radar control building with a roof-mounted solid parabolic antenna.

Sri Harikota Ground Telemetry Satellite Tracking Station

32. (TSR) The Ground Telemetry Satellite Tracking Station consists of two telemetry-related areas, a tracking control building (Figure 12 and Table 9), and a meteorological tower. The station is on a short, straight access road 1.7 nm west of the Space Launch Facility and is oriented on a north/south axis.

33. (TSR) A telemetry control building with a single- and a four-element roof-mounted Yagi antenna is at the northern end of the station (Figure 13 and Table 10). An antenna pedestal at the southeast corner of the building contains a 16-element Yagi antenna. A second telemetry control building (Figure 14 and Table 11), at the midpoint of the access road, contains a single-element Yagi antenna and a possible tracking device mounted immediately south of the building. An eight-element Yagi antenna is mounted on a pedestal east of the building. A meteorological tower is farther to the south and on the west side of the access road. The southernmost building is a tracking control building (Figure 15) with a roof-mounted parabolic antenna.

Sri Harikota Space Launch Facility

34. (TSR) The Space Launch Facility consists of a space launch area and a rocket motor storage area.

Space Launch Area

35. (TSR) The space launch area (Figure 16 and Table 12) contains two concrete launch pads. The larger pad, designated pad 5, is used for space launches. The smaller pad, designated pad 6, is south of pad 5 and is used for sounding rocket/space-related launches. The sounding rocket launcher currently at pad 6 was the launcher moved from pad 2 in the Rocket Launch Station in July 1977.

36. (TSR) Construction of this area was first observed in October 1974. By October 1977, the major buildings were externally complete and space-related pad 5 was complete. Pad 6, two observation towers, a meteorological tower, and a support building were all completed after October 1977. The first satellite launch to use the SLV-3 system is expected to be launched in the second half of 1979.[11] The Rohini Satellite (RS-1) to be carried aboard the first SLV-3 will monitor and relay the performance of the SLV-3 system during launch as well as the orbital characteristics of the satellite once it is in orbit.[1]

37. (TSR) A circular earth-mounded launch control bunker (Figure 16 and Table 12) is west of the two pads and on the south side of the access road. A drive-through rocket assembly/check-out building is farther to the west. An equipment maintenance building is on the west side of the access road, and the rocket motor storage building (Figure 17) is 0.5 nm to the north.

Cable Conduit System

38. (TSR) The cable conduit system which connects facilities within the complex is shown on Figure 1. Within the space launch area, both launch pads are connected to the launch control bunker, the rocket assembly/checkout building, and several launch support buildings. Within the rocket launch station, all four launch pads, the two launch control buildings, and one sounding rocket assembly/checkout building are interconnected. Within the tracking facility, the telemetry control building, the COTAL radar, and the tracking control building are connected. Within the ground telemetry satellite tracking station, both telemetry control buildings and the tracking control building are connected. The microwave communications facility is also connected to this conduit system.

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Table 9. Structures in the Sri Harikota Ground Telemetry Satellite Tracking Station (Items keyed to Figure 12)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete	Remarks
1	Telemetry control bldg				Oct 74	Jul 75	
2	Antenna pedestal					Feb 78	16-element Yagi antenna mounted here in Dec 78/Jan 79; pedestal not present in Apr 77
3	Support bldg					Oct 78	Not present in Mar 78
4	Telemetry control bldg				Oct 74	Jun 75	
5	Antenna pedestal				Jun 75	Jul 75	
6	Meteorological tower					Dec 78	Not present in Nov 78
7	Tracking control bldg				May 76	Apr 77	

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Table 10. Northern Telemetry Control Building, Sri Harikota Ground Telemetry Satellite Tracking Station (Items keyed to Figure 13)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	First Seen Ucon	Complete	Remarks
1	Single-element Yagi antenna		Oct 78	Not present in Mar 78
2	Four-element Yagi antenna		Oct 78	Not present in Mar 78
3	16-element Yagi antenna	Dec 78	Jan 79	Crane observed at this site being used to begin assembly of antenna

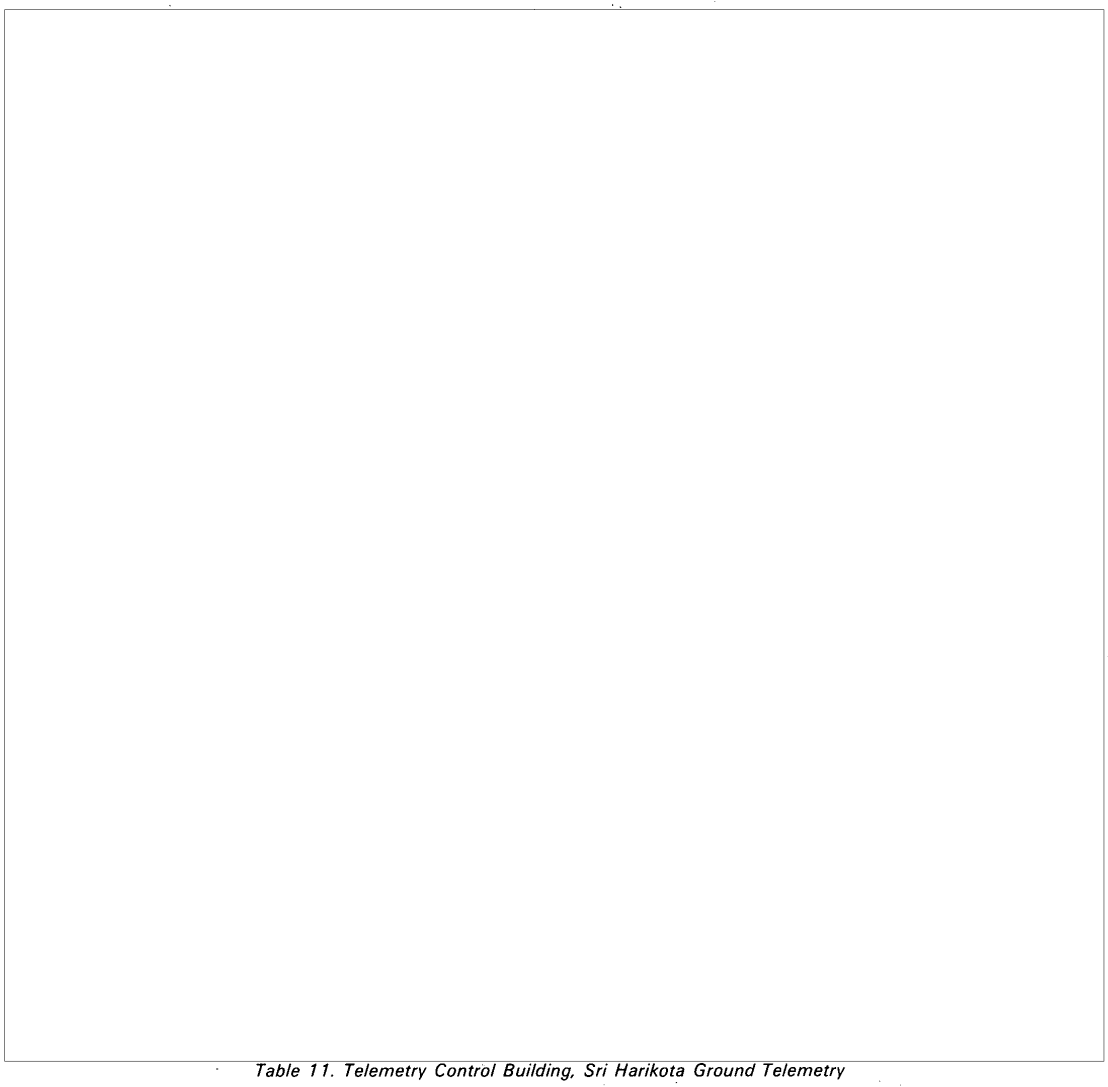

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Table 11. Telemetry Control Building, Sri Harikota Ground Telemetry Satellite Tracking Station (Items keyed to Figure 14)

This table in its entirety is classified TOP SECRET RUFF

Item	Description	First Seen Complete	Remarks
1	Eight-element Yagi antenna	Mar 76	Not present in Nov 75
2	Single-element Yagi antenna	Mar 76	Not present in Nov 75
3	Poss tracking device	Mar 78	Not present in Apr 77

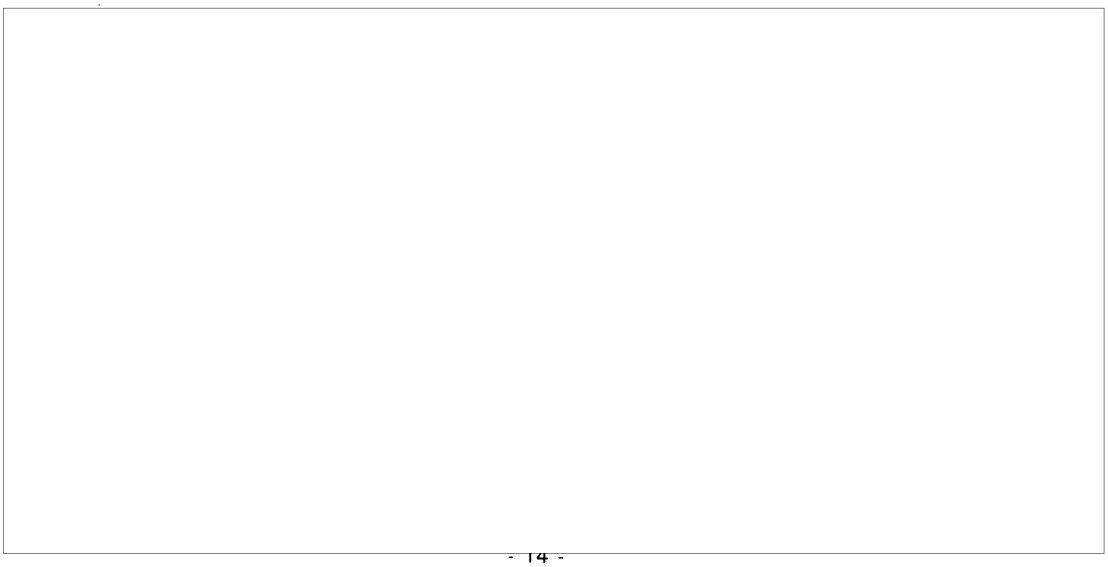

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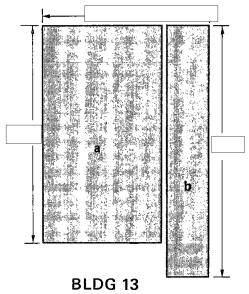
Table 12. Structures in the Space Launch Area, Sri Harikota Space Launch Facility
(Items keyed to Figure 16)

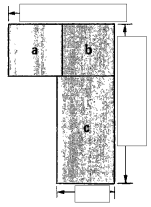
This table in its entirety is classified TOP SECRET RUFF

Item	Description	Dimensions (m) L	W	H	First Seen Ucon	Complete	Remarks
1	Support bldg					Jul 78	Not present in Apr 78
2	Observation tower					Feb 78	Not present in Nov 77
3	Observation tower				Feb 78	Mar 78	
4	Launch pad 5				Nov 75	Apr 77	Space launch pad for SLV-3
5	Environmental shelter				Feb 77	Apr 77	Rail-mounted shelter used to cover the SLV-3 erector/launcher
6	Launch pad 6				Oct 77	Feb 78	Used for sounding rocket & space vehicle-related launches
7	Support bldg					Jan 76	Not present in Nov 75
8	Support bldg					Jan 76	Not present in Nov 75
9	Meteorological tower					Oct 78	Not present in Jul 78
10	Launch control bunker				Sep 75	Oct 77	Diam & height overall of earth-covered bunker
11	Support bldg				Nov 75	Feb 77	
12	Pumphouse					Oct 76	Not present in May 76
13	Rocket assem checkout bldg				Nov 75	Oct 76	
a	High-bay sect						
b	Annex						
14	Equipment maint bldg				Nov 75	May 76	
a	Sect						
b	Sect						
c	Sect						
15	Admin/support bldg					Oct 76	Not present in May 76
16	Substation				Oct 74	Jun 75	



BLDG 13

DIMENSIONS IN METERS



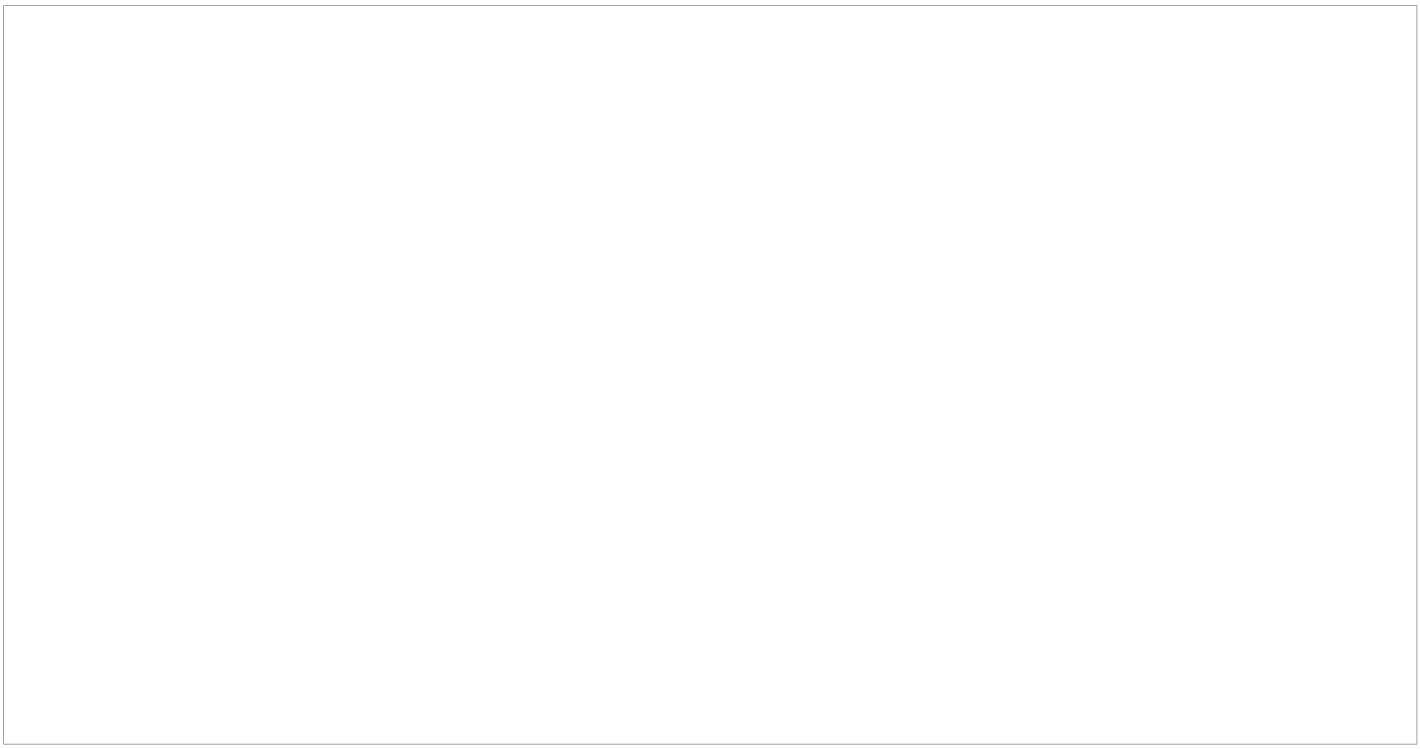
BLDG 14

25X1

RCA-15/0002/79

25X1

25X1



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(TSR) All relevant KEYHOLE imagery acquired from [redacted] was used in the preparation of this report. 25X1 25X1

MAPS OR CHARTS

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REQUIREMENT

COMIREX P01
Project 290010DP

(S) Comments and queries regarding this report are welcome. They may be directed to [redacted] Regional Analysis Division, Imagery Exploitation Group, NPIC, [redacted] 25X1 25X1

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